

REMARKS

Support for the amendment of Claims 42, 69, and 70 is found in the patent application as originally filed, in Paragraph [0074], at Page 18, lines 22 - 28. Specifically, this text recites: “Diffusion bonding is a direct bonding process which provides smooth, strong bonds that do not absorb or release process fluids, and do not contribute impurities to the process fluids, as a welded joint might do. A process for diffusion bonding two metallic components involves finishing their mating faces to a very clean, smooth, and flat surface finish, then applying pressure and heating the components until the atoms of the respective surfaces interdiffuse, forming an interlocked layer, without liquefying either of the surfaces or introducing any voids, pits, or inclusions.” Applicants then go on to describe the precise requirements for surface finish, and the processing conditions which are required to form the interlocked surfaces without liquefying the surfaces being bonded and without introducing any voids, pits, or inclusions.

Claims 42, 44, 46 - 52, and 69 - 73 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Craig et al.

The reference cited by the Examiner (Craig et al.) is not enabling for any diffusion bonding method. Craig et al. merely comments that diffusion bonding of stainless steel layers is known in the art, and refers to U.S. Patent No. 3,530,568 to Owczarski et al.. The Owczarski et al. reference teaches a method for bonding in which the bonding surface is covered with a thin nickel or nickel-cobalt alloy. The surfaces of alloys which were bonded were not processed prior to bonding, but were used “as received from the mill”. (Col. 2, lines 21 - 30 and lines 52 - 57). This direct use of mill produced sheet materials “as is” was possible because of the interlayer of plated nickel or nickel alloy on the bonding surface, which flowed to create a bond despite surface defects which might be present. (Col. 3, lines 40 - 45).

The Owczarski et al. reference actually teaches away from the present invention. At Col. 3, lines 21 - 37, this reference teaches that in an instance where the surfaces to be joined were not

plated with nickel or a nickel alloy, but were instead ground and polished, cleaned, and then diffusion bonded, the diffusion welds contained a precipitate-laden planar joint having poor mechanical properties. Further, “joints made in the manner without the plated interlayer broke apart during attempts to machine tensile specimens.” (Col. 3, lines 38 - 40)

The Examiner comments that the Craig et al. reference does not disclose that the metal layers which are to be bonded must have a particular surface roughness, but argues that it would have been obvious to one skilled in the art to prepare the metal layers in the manner described by applicants. He refers to U.S. 3, 530,568, the Owczarski et al. reference at Col. 5. Applicant’s attorney could not find anything about surface finishes in Col. 5 of this reference. The only teaching is that it was found that satisfactory bonds could be made between nickel-base superalloys of high aluminum/titanium content, provided that an interlayer material (nickel, or nickel alloy plated surfaces) was utilized, and provided further that the thickness of the interlayer and the conditions of bonding were carefully regulated. As mentioned above with reference to Col. 3, lines 21 - 40 of the Owczarski et al. reference, the teaching is that diffusion bonding of surfaces without an interlayer material, did not provide good diffusion bonding. This was the case even when “Prior to diffusion welding, the surfaces to be joined were ground flat and parallel and polished with a 500 grit metallographic paper” (Col. 3, lines 21 - 25)

As applicants argued above, there is no enablement of applicants’ claimed invention in the Craig et al. reference, nor in the Owczarski et al. reference. It is a well-established precedent in patent law that “obvious to try” is not the standard for obviousness under 35 U.S.C. § 103. “The mere need for experimentation to determine parameters needed to make a device work is an application of the often rejected obvious-to-try standard and falls short of the statutory obviousness of 35 U.S.C. §103.” (*Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).) “An ‘obvious-to-try’ situation exists when a general disclosure may pique the scientist’s curiosity, such that further investigation might be done as a result of the disclosure, but the disclosure itself does not contain a sufficient teaching of how to

obtain the desired result or indicate that the claimed result would be obtained if certain directions were pursued.” (*In re Eli Lilly & Co.*, 902 F.2d 943, 14 U.S.P.Q. 2d 1741 (Fed.Cir. 1990).)

The Examiner has argued that it would have been obvious to one of skilled in the art to bond the kind of corrosion-resistant materials described by applicants in the manner described and claimed by applicants. However, the Examiner has not cited any reference which suggests the materials and process conditions described and claimed by applicants. While it might have been obvious to try to diffusion bond sheets of material with patterns etched in the sheets, there was no enablement of applicants’ diffusion bonding method in the references cited. Further, the Owczarski et al. reference teaches away from the invention, by providing a comparative example of bonding without using an interlayer material (of plated nickel or nickel alloy) between the bonding surfaces, where the diffusion bonding was not successful. The Examiner has failed to provide a prima facie case of obviousness.

In view of the above, the Examiner is respectfully requested to withdraw the rejection of Claims 42, 44, 46 - 52, and 69 - 73 are under 35 U.S.C. § 103 (a) as being unpatentable over Craig et al.

Applicants contend that the presently pending claims as amended are in condition for allowance, and the Examiner is respectfully requested to enter the present amendment and to pass the application to allowance.

The Examiner is invited to contact applicants’ attorney with any questions or suggestions about amendment of the claims. The telephone number of applicants’ attorney is provided below.

Respectfully submitted,

A handwritten signature in cursive script, reading "Shirley L. Church", is written over a horizontal line.

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